

Serial No.: 10/730,440
Office Action Date: 30 June 2006

Filed: 12/8/2003
Amendment Date: 9/26/2006

REMARKS/ARGUMENTS

This is in response to the Office Action issued on 30 June 2006, with claims 1-36 pending in the application. Claims 5, 10, 15, 17 and 28 have been withdrawn from consideration. Claims 1-4, 6-9, 11-14, 16, 18-27, and 29 – 36 stand rejected.

By this response, claim 21 has been amended. No new matter has been added by this response to the Office Action.

Allowable Subject Matter

The Office Action objected to claim 21 as being dependent upon a rejected base claim, but stated it would be allowable if rewritten in independent form including all of the limitations of the base and intervening claims. This is noted with appreciation.

Claim 21 has been amended as described, and consideration of newly amended claim 21 is requested.

Claim Rejections – 35 U.S.C. § 102(b)

Claims 1, 6, 11, and 25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Yoshiaki, Japanese Publication number JP 9-264492 (*Yoshiaki*). Applicant respectfully traverses any rejection of Claims 1, 6, 11, and 25 in view of *Yoshiaki* because *Yoshiaki* fails to teach or suggest all the elements of the claims, as is required under 35 U.S.C. § 102(b).

Yoshiaki teaches a vibration control device for electrically viscous fluid, including the electrically viscous fluid retained in a control gap between an outer surface of a rotor and an inner surface of a cylindrical body, wherein viscosity of the fluid is increased by applying voltage to an electrode surface.

Claim 1 sets forth an apparatus operable to provide damping between a sprung mass and an unsprung mass, comprising, *inter alia*, a linear to rotary conversion mechanism comprising a translatable member that is adapted for generally linear translation, a rotatable member, and a damping mechanism comprising a hub that is fixed to the shaft, a means for generating a single electromagnetic field in response to an applied electrical signal, and a fluid having a viscosity that may be continuously varied by

GMC3105

12 of 16

Serial No.: 10/730,440
Office Action Date: 30 June 2006

Filed: 12/8/2003
Amendment Date: 9/26/2006

application of the electromagnetic field that is in touching contact with the hub, wherein application of the variable electromagnetic field to the fluid produces changes in the viscosity of the fluid that in turn provides variable resistance to rotation of the hub and translation of the translatable member. The means for generating the single electromagnetic field comprises a coil 200 having a plurality of windings and which may also incorporate a magnetic core in order to enhance the strength of electromagnetic field 158, as described in Para. 0032 of the specification and shown in Figs. 2 and 3.

Applicant respectfully asserts that the invention of claim 1 is distinguishable from *Yoshiaki* because *Yoshiaki* fails to teach or suggest a means for generating a single electromagnetic field in response to an applied electrical signal, and fails to teach or suggest a fluid having a viscosity that may be continuously varied by application of the electromagnetic field that is in touching contact with the hub, wherein application of the variable electromagnetic field to the fluid produces changes in the viscosity of the fluid.

Claims 6 and 11 are patentably distinguishable from *Yoshiaki* for the same reasons as set forth with regard to claim 1. Claim 25 is dependent upon now allowable claim 11, with further limitation, and is therefore allowable for the same reasons as cited above.

Claim Rejections – 35 U.S.C. § 103(a)

Claims 26, 27, 29, 30, 31, 32, 33 have been rejected under 35 U.S.C. § 103(a) as being anticipated by *Yoshiaki*. Each of claims 26, 27, 29, 30, 31, 32, 33 is dependent upon now allowable claim 11, with further limitation, and is therefore allowable for the same reasons as cited above.

Claims 2-4, 7-9, 12-14, 16, 18, 19, 20, 22-24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yoshiaki* in view of *Miesner*, USPN 5,878,997 (*Miesner*). The Office Action stated that *Yoshiaki* lacks the limitation of the fluid being magnetorheological (MR) fluid, which is taught by *Miesner*, which further teaches a damping apparatus having MR fluid and coils. It further stated that it would have been obvious to one skilled in the art at the time of the invention to have modified the fluid of *Yoshiaki* to be MR fluid, in view of the teachings of DE'176, in order to provide a

GMC3105

Serial No.: 10/730,440
Office Action Date: 30 June 2006

Filed: 12/8/2003
Amendment Date: 9/26/2006

functionally equivalent means of permitting a change in viscosity of the fluid to vary resistance to hub rotation.

Applicant respectfully traverses any rejection of claims 2-4, 7-9, 12-14, 16, 18, 19, 20, 22-24 as being unpatentable over *Yoshiaki* in view of *Miesner*.

The invention of *Yoshiaki* has been previously described above. *Miesner* discloses use of an active MR damper which includes an inner field coil 120, an outer field coil 130 and an MR fluid-filled narrow channel 60 therebetween. *Miesner fails to disclose* an outer surface of a hub and sidewall of a housing defining a channel therebetween in which a single electromagnetic field is generated and a fluid located within the channel having a viscosity that can be varied by application of the electromagnetic field. *Miesner* teaches an electromagnetic structure having a cooperative dual-coil arrangement whereby each coil generates a separate respective magnetic field. (See, e.g., Col. 5, Lines 47-60). The arrangement is specifically designed such that the magnetic fields substantially cancel out everywhere within the damper except within the narrow channel between the individual coils. (See, Col. 6, Lines 1-9).

Applicant respectfully asserts that claim 2 of the instant invention is patentably distinguishable over *Yoshiaki* in view of *Miesner* because *Yoshiaki* and *Miesner* fail to teach or describe a damping apparatus having MR fluid and a single coil operative to generate a single electromagnetic field in response to an applied electrical signal, as they are required to do under 35 U.S.C. §103(a).

Furthermore, applicant respectfully traverses the Office Action comments that it would have been obvious to one skilled in the art at the time of the invention to provide a functionally equivalent means of permitting a change in viscosity of the fluid to vary resistance to hub rotation. Under the law, an obviousness rejection is improper if substantial reconstruction or redesign of the elements or change in the basic principles of operation of the prior art references is necessary to arrive at the invention. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (C.C.P.A. 1959).

Applicants assert that it is well known that electrorheological fluids and MR fluids have different physical characteristics, including density, viscosity ranges, strength of the yield stress, thermal properties, and required electrical stimulation and

GMC3105

14 of 16

Serial No.: 10/730,440
Office Action Date: 30 June 2006

Filed: 12/8/2003
Amendment Date: 9/26/2006

responsiveness to the electrical stimulation. The different physical characteristics require substantially different electrical actuation hardware, e.g., coils and electromagnets for MR fluid compared to electrodes for ER fluid, and different actuation hardware and strategies for controlling the actuation hardware. Furthermore, the differences in the physical characteristics and the actuation control hardware may result in different dynamic performance ranges and time response characteristics. This is discussed in Para. 0038 of the instant invention. Thus, an apparatus utilizing an electro-rheological fluid is not the functional equivalent of an apparatus utilizing MR fluid, as asserted by the Office Action. An apparatus utilizing an electro-rheological fluid is not necessarily readily adapted to application of a system which uses MR fluid and can require substantial redesign, which is impermissible under the law. This further distinguishes claim 2 from the cited art.

Claims 3-4, 7-9, 12-14, 16, 18, 19, 20, 22-24 are patentably distinguishable from the prior art for the same reasons as described with reference to claim 2, and are therefore allowable over the cited art.

Claims 34-36 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Yoshiaki* in view of Bell, US Patent Application Number 2003/0030523. Each of claims 34, 35, and 36 is dependent upon now allowable claim 11, with further limitation, and is therefore allowable for the same reasons as cited above.

GMC3105

15 of 16

Serial No.: 10/730,440
Office Action Date: 30 June 2006

Filed: 12/8/2003
Amendment Date: 9/26/2006

Conclusion

Based on the above, it is respectfully submitted that all pending claims are in condition for allowance, and therefore, the same should be allowed to proceed to issue. Furthermore, upon allowance of the pending claims, applicant respectfully requests reconsideration of claims 5, 10, 15, 17 and 28 earlier withdrawn in response to a restriction requirement and that same be found allowable and allowed to proceed to issue pursuant to 37 CFR §1.141.

If the Examiner has any questions regarding the contents of the present response the Applicants' attorney may be contacted at the phone number appearing below.

Respectfully submitted,



Stephen T. Mahan
Registration No. 56,565
Telephone: (248) 676-9095

GMC3105

16 of 16